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NATURE-STUDY AND SCIENCE WORK IN THE FRANCIS W. PARKER SCHOOL.

I. NOTES.

THE following outline represents the work in nature-study and science as it is planned for the ensuing year, for the first eight grades, in the Francis W. Parker School.

The studies here included fall into two groups: those in which the children are brought into direct contact with the phenomena of nature, and those in which they work with materials in their natural state. The studies of the first group help the children to enjoy the beauty of nature and to appreciate the laws which underlie its various manifestations; those of the second lead them to discover, through their own experiences, the principles and processes of the great primary industries — those pertaining to food, shelter, and clothing.

The purpose of the outline is to set forth, for study and criticism, the quantity and quality of the above-mentioned work. On account of lack of space, the outline is most incomplete. It is not possible within its limits to give the related work in history, mathematics, literature, and art, or a description of all the forms of study and expression which the work involves in each grade. All of the handwork of the school might properly be placed in this outline, but much of the work in wood and metal does not appear because it is not correlated with the science or nature-study work.

If the outline is read from the top downward — that is, if the work of one grade only is considered — it must be remem-

bered that only part of the work of the grade is represented, so that there is sometimes little apparent unity or connection between the subject-matter which appears there and the occupations. If, however, the outline is read from left to right, according to the subjects as they appear in each grade, it is easy to observe the progression in each phase of the work, and to trace the attempt which has been made to follow the growth of the children from grade to grade, in their enlarging experiences, their increased physical ability, and their greater intellectual development.

It should be understood that almost all the work outlined is done in response to some demand of the school community — a demand which the children are able to understand and appreciate, so that in every phase of the work — in the experimental science, in cooking, in gardening, and in the occupations — the goal of the child's efforts seems to him "worth while," and he is stimulated to his highest degree of activity and sustained through the necessary drudgery by the interest which he has in the end to be attained.

In order to give this part of the work its full significance, it will be necessary to state briefly the general plan and purpose of the school: The school was organized to carry out, as far as possible, the educational theory of Colonel Francis W. Parker, which demands that all the work of the school should tend directly to the formation of perfectly developed human beings — toward the creation of an ideal community. This ideal governs the selection of work throughout the course, and in order that the movement shall be continuous from the kindergarten through the high school, it is obviously necessary to select the work, primarily, with reference to the ideal, but also with reference to the individual experiences, social requirements, and interests, and, again, with reference to the physical and mental stage of development of the children in each grade. The controlling educational principle in the selection of the work is that self-activity is the law of growth. Under this ideal the child's will and his motives in work become the essential consideration of the teacher, rather than the acquisition of certain definite knowledge; the knowledge

acquired is, however, of the utmost importance in the teachers' eyes, because it is an absolute measure of the quality of the work done.

Finally, the outline as here presented is in no sense a finished product. It is the outcome of the thought and experience of the teachers of the school. It represents their efforts to find the best experimental work for each group of children, keeping in mind their entire school life.

In the study preceding the making of the outline the value of work was judged by certain standards. These standards of value may be made evident by the following statements concerning the efforts which were made: (1) to select only that work which is intrinsically valuable, capable of arousing strong images — possessing possibilities of infinite growth — work in harmony with the ideal of the school; (2) to choose the work best adapted to the children, judging from their experiences, their fundamental interests, and their various stages of development; (3) to discover the real demands of the school community, and so distribute or grade them that in each group of children the work should be new enough, difficult enough, and attractive enough to stimulate them to genuine independent hard work; (4) to make the school environment rich and varied enough in material and problems to furnish incentives to work in many directions — thus providing for the all-around development of the children; (5) to cultivate in the children throughout their school life a respect for good work and good workers, and to leave them with a genuine desire to discover the laws and truth of things, and with a wholesome, open-minded attitude toward nature, humanity, and God.

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WHAT TRAINING IN PHYSIOLOGY AND HYGIENE MAY WE REASONABLY EXPECT OF THE PUBLIC SCHOOLS?[1]

In the public schools of today various subjects are taught, and for various reasons. Some, like arithmetic or the reading and writing of English, are indispensable tools of modern civilized life; others, like geography and history, impart necessary information or promote general intelligence; still others, like algebra, geometry and Latin, are agents of mental discipline or else afford necessary preparation for subsequent work. Physiology and hygiene, the studies with which we are concerned in the present paper, were introduced into the public schools for the express purpose of affording information concerning the structure and functions of the human body, being expected thereby to contribute to the preservation and promotion of health; and they have kept their place, in spite of serious shortcomings, as a concession to the practical importance of sound ideas concerning health and disease.

The training which may reasonably be expected in the reading and writing of English, in arithmetic, in geography, or in Latin is the subject of frequent discussion in educational gatherings and is doubtless influenced by such discussions; but it is determined chiefly by the examination requirements of the upper grades and by the entrance requirements of higher educational institutions. With physiology and hygiene the case is different. Proficiency in these is rarely made a condition of promotion. They are seldom included in the list of requirements for admission to colleges or technical schools, and never in those for medical schools. They are not often much considered in educational congresses. And yet it is doubtful whether any subject in the whole curriculum of the public schools is of greater intrinsic importance as a preparation for life, or is capable of

[1] Read before the American Social Science Association, Boston meeting, May, 1903.

affecting more profoundly the whole mental attitude of men and women toward an enduring and well-organized civilization.

The real importance of physiology and hygiene is unquestionably far greater today than it was twenty-five years ago. At that time physiology was a new science. It was still commonly taught in medical schools as an adjunct to anatomy, and the double-headed professorship of anatomy and physiology had not then become extinct. As for hygiene, this was largely a body of precepts based upon *a priori* reasoning, or else of deductions derived jointly from anatomical knowledge, common experience, and common-sense. Disease was only a little more baffling than health, and the promotion of one poorly understood condition by the prevention of one still less comprehended was not only a most unsatisfactory, but a most unscientific undertaking. Nevertheless, in spite of this difficulty and uncertainty, physiology and hygiene, such as they were, have steadfastly held their place in the curriculum of the public schools, no doubt because of an unconquerable belief that they would somehow furnish to the developing mind and the forming character some real and lasting help in the preparation for life.

And at last this belief seems likely to bear fruit and to justify its long and patient expectation. For today physiology has won an established and recognized position as an independent science. It has become entirely separated from anatomy. It has its own professors in our medical schools and universities. We have a strong and active American Physiological Society, composed of expert investigators and teachers, and a flourishing *American Journal of Physiology,* which publishes regularly budgets of important discoveries.

In hygiene the progress has been even more remarkable. Twenty years ago the infectious diseases were as mysterious as ever: but today we understand the essentials of their operation and also to a great extent the mechanism of their dissemination, and, therefore, in many cases the ways of their prevention. The clouds of mystery which until lately hung about them have largely been cleared away, and a new hygiene, based partly upon experimental physiology and partly upon experimental medicine,

has come into being. Meantime an enlightened sanitary engineering is building improved sewers and water-works, and dealing with the purification of sewage and water, with the construction of sanitary pavements, with the dust nuisance, and with efficient scavenging and garbage destruction. Boards of health are equipped with laboratories for sanitary testing and research. They are supervising the medical inspection of schools. They are isolating cases of infectious disease and securing the disinfection of clothing and of houses. They are enforcing vaccination. They are vacating unwholesome dwellings.

Educators themselves are engaged in hygienic endeavors. They are providing for playgrounds. They are beginning to attend as never before to the ventilation of school buildings. They are interested in the lighting of schoolrooms, in the seating of pupils, and in their sight and hearing. The home also is receiving the attention of hygienists. Its site, its drainage, its wall papers, its ventilation, its cookery, are undergoing careful investigation.

And, finally, personal hygiene — the care of the individual body, its exercise, its fatigue, its work, its rest, its play, its clothing, its bathing, its hunger and thirst and sleep, its growth and its old age — is being dealt with today, not superficially and by tradition or experience alone, as formerly, but also by experiment. Physiology and hygiene have become *experimental* sciences, and have thus taken on a new and higher value. In view of all these marvelous changes, we may properly ask and undertake to answer the question which forms the subject of this paper.

But first and always we must keep steadfastly in mind the end and object sought for in the training under consideration. This has always been, and still is, primarily practical and technical; namely, a sound preparation for the right conduct of physical life. For although it is reason enough for increasing the efficiency of instruction in these subjects that they give information on matters of great human interest, and that, when rightly taught, they are of high educational value, still the primary purpose of teaching them is not to give information nor

mental discipline, but because their subject-matter is of immediate and enduring importance in determining and promoting the right conduct of the physical life, and especially the preservation and promotion of health. Their value is special rather than general, practical rather than cultural, technical rather than disciplinary.

We may confess frankly that physiology and hygiene have not always hitherto justified their place in the curriculum by their results. It would be going too far to deny that they have been without influence, or that in exceptional cases they have not been valuable; but they certainly have not, on the whole, accomplished what was originally expected of them. Their results have been disappointing, and it is by no means unusual to hear competent educators express the opinion that it would be better to drop them altogether. Physiology and hygiene are too frequently looked upon by school authorities as an unavoidable necessity, and by teachers and pupils as a bore. And yet we doubt whether any of these superintendents or teachers would care to take the responsibility of banishing them altogether from the curriculum. They may not be a success; but the conviction remains that they ought to be a success, and doubtless the hope, however faint, that some day they will be.

The present unfortunate condition of affairs is due, in our opinion, largely to the fact that the primary purpose of these subjects in the curriculum has been neglected or forgotten. They were perhaps introduced prematurely, as has been suggested above. Fifty years ago anatomy was the one branch of medical science about which definite statements could be made, little was shown about physiology, and the great field of hygiene was largely a matter either of popular tradition or of impressions derived from personal or racial experience, often, indeed, surprisingly accurate, but nevertheless lacking in the certainty of experimentally demonstrated fact.

It is only exact knowledge which lends itself to school instruction. We do not teach electricity in our courses in physics by speculating about thunderbolts or the nature of magnetism, but by telling what we know of the production, the conduction, and the induction of electrical energy. We leave the region of the

indefinite to the investigator. It is easy to see, therefore, how it came about at the outset that in planning the work in physiology and hygiene in schools the details of gross and minute anatomy should have formed the major part of the whole. Function was treated only sparingly, because very little was known about it; and considerations of health and disease occupied an insignificant place simply because definite statements could not possibly be made about them. The instruction in school physiology and hygiene was chiefly anatomical for the reason that the dissecting room was the sole laboratory of the medical school. It was the one region of real and accurate knowledge of the subject.

We have said above that this condition of hygienic knowledge has been entirely transformed during the last twenty years. The physician is far less mysterious in his manner than formerly, because his fund of knowledge is vastly greater. He often explains his reasons to his patient and discusses the facts of his profession with "the laity," where he would not have done so fifty years ago. It was within twenty years that one of our leading pathologists was heard to define malaria by remarking, "When you don't know what it is, it is malaria." Today he would not give that definition, but would delight to describe the wonderful story of those discoveries which within a score of years have led to our present satisfactory understanding of the nature and mode of dissemination of this disease.

The teaching of physiology and hygiene in the public schools has lagged far behind this march of medical and hygienic progress. It is inexcusably behind the times. We now have facts which anyone can teach and which should be made known as a preparation for the proper conduct of life; and it is these facts which should form the main part of the teaching. The subject-matter should be thoroughly revised, and in no more important particular than in the restriction of anatomy to the minimum amount needed to give a clear conception to the general structure of the body as a mechanism and of the normal working of that mechanism. In a rural schoolhouse on the Maine coast we once saw upon the blackboard, painfully written down by a

fisherman's child, a long and learned list of bones found in the human body. Even for a medical student the list, as such, apart from the physiology and surgery of the bones, would have been of small value; for the children of fishermen the bones of the cod or haddock or of the domestic animals would probably have been of greater consequence. An arid osteology is a poor introduction to the study of modern hygiene, and one not calculated to arouse a compelling interest in the subject.

Similar considerations hold with regard to the teaching of physiology. The educational value of this science, it is true, is much greater than is that of pure anatomy, for, in the first place, it is more interesting. Not only in childhood, but throughout life, we do not care greatly about the parts of a machine unless we know or can guess their use. From this point of view physiology is a good teaching subject, and all the more so because it deals with a machine in which most of us are naturally interested. The study of the activities of the human body has also the highest philosophic value. It imparts that first and most important lesson for the conduct of life — a lesson which every person leaving the upper grades of the public schools should carry away with him — that the human body has a material basis and is a *mechanism*, a *machine*. We must constantly recall, in order to emphasize, Huxley's saying that "the distinctive feature of modern as contrasted with ancient physiology" is "the fundamental conception of the living body as a physical mechanism." That this fact is not with most people a part of the philosophy of living is shown by their consumption of patent medicines and the frequent neglect of the commonest care of the body, such as would be naturally given to a watch or a bicycle.

We have urged that anatomy has no place in the public-school curriculum except as it is necessary to the understanding of the problems of physiology and hygiene; and we shall see it cut down to the minimum needed for this purpose without the slightest regret. We should not feel the same if physiology were to be similarly made strictly subservient to personal hygiene; that is, if its philosophical value were to be neglected; but,

fortunately, this is not necessary. The physiology which is most useful in understanding the problems of personal hygiene is almost exactly the same body of principles which has the greatest philosophic value; and the method of presenting them is the same for the one purpose as for the other. We have not the time to enter into details in this matter, but we are speaking from experience and are sure of our ground. The instruction in physiology should aim at the outlines of the more important functions of muscular contraction, nervous activity, circulation, nutrition, temperature regulation—all of these expressed as far as possible in terms of physics and chemistry; and it should endeavor to avoid needless details. For example, the pupil should understand that the heart is a force pump, but it is not necessary that he should understand the exact structure or mechanism of the auriculo-ventricular valves.

Again, physiology should not be made primarily, or even to any large extent, in public schools, a means of laboratory training. Such training can be had more readily and more advantageously in chemistry and physics. To attempt to give the same laboratory training in physiology as in these subjects would inevitably be to consume time which is more urgently needed for hygiene. The fundamental facts of physiology can be demonstrated and enforced in the laboratory, even in common schools, without much difficulty, and we would not for a moment depreciate the value or the necessity of a certain amount of this kind of instruction; but the use of the laboratory (always time-consuming) must not be allowed to distract attention from the true function of physiology and hygiene or to interfere with its fruitful realization.

A course of moderate length in physiology should suffice to impart enough facts of structure and function to furnish a solid basis for sound training in hygiene, and to give meanwhile an abiding sense of the material composition and mechanical character of the human body and some knowledge of its environment and operation. With so much of preparation it is easy to pass on to a practical consideration of health and disease, the means of promoting the former and of avoiding the latter. Health

becomes simply normal, disease abnormal, living. Such terms as "constitution," "strength," "weakness," "feebleness," "robustness," are easily understood by constant reference to mechanisms well or poorly made, or to structures strong or weak. Wounds become interference caused by invasions or damage by extraneous matters — bullets, knives, parasites, clubs, dogs, slivers — which are as obviously out of place in living mechanisms as dirt in the works of watches. Germs are microscopic invaders, microscopic parasites. They enter and wound and kill, not mysteriously, but by damaging or interfering with the human mechanism. Best of all, they can often be kept out by the avoidance of exposure, as truly as bullets can.

Passing on to the strictly hygienic part of the subject, first in logical sequence comes *personal hygiene,* the proper regulation of the activities of individual life — muscular work, mental activity, feeding, the protection against colds and other inflammations, the care of the body by bathing and clothing and the like. These should not be touched upon in short paragraphs which, like after-thoughts, conclude the chapters on anatomy or physiology, but should be separately and fully treated for their own sake, and from the standpoint of the organism as a whole rather than from that of special organs. These are subjects about which everyone needs real and true information, and sooner or later seeks it. Shall such knowledge be obtained from the public schools, or sought eagerly but in vain in the brazen advertisements of magazine originators of new systems of physical training, or in the rash and rarely disinterested advice of advocates of new breakfast foods?

Modern hygiene begins with the individual, but deals also with the hygiene of the family, of the community, of the state, and of nations. In rapid review of the place which these branches of the subject should occupy in our preparation for sound private and public life, it must not be forgotten that the great majority of the pupils in our public schools have no opportunity or intention to enter colleges or higher schools, and yet are likely to become householders, housekeepers, heads of families, or citizens. The principles underlying household or *domestic*

hygiène and sanitation therefore claim some consideration at their hands. These should include such questions as the proper site of the house, the value of fire-places as ventilators, the importance of wall papers free from arsenic, the advantages of bare floors and of simple rugs as compared with carpets difficult to clean, the necessity of a pure and abundant water supply, the desirability of prompt removal of wastes by drainage and by such other devices for rural communities as may be made most sanitary under the circumstances, the dangers of damp cellars with the reasons why cellar dwellings are so peculiarly unwholesome, the dangers of illuminating gas (especially the modern so-called "water gas"), the need of careful consideration and frequent inspection of gas fixtures to avoid small but dangerous leaks, and other similar matters bearing directly or indirectly upon the welfare and sanitary condition of the home. Here might well be told the truth in regard to the advantages and dangers of cesspools and sewers, and the effects of leaky or otherwise defective plumbing.

Place should also be found, and might easily be made by the sacrifice of some osteology and histology, for a brief consideration of *the health of communities*, such as thickly settled neighborhoods, growing towns or cities; of the dangers attending impure water supplies and defective sewerage systems; and the importance of methods for the sanitary removal and disposal of garbage, rubbish, and the other wastes of life. Something might well be said regarding the need of proper municipal supervision of all these matters as the essential of a rational municipal sanitation and of the sanitary value of good public service. Here also might be touched upon the advantages and the right use of municipal parks, playgrounds, and gymnasia; of public lavatories, water-closets, and wash-houses; of smoke abatement and noise suppression; and something might be said regarding clean streets and the thoughtless scattering of papers, banana skins, and the like rubbish, which necessitates a costly scavenging; something regarding pure ice and especially pure milk — problems in the solution of which all classes of the community must eventually take an active interest and participation, if reform is to come.

And, finally, room should be found for a brief explanation of quarantine, its advantages and disadvantages; the isolation of cases of infectious disease and the reason why this is so essential to the public, though so inconvenient to the individual; the necessity for public hospitals for contagious diseases and for municipal or state sanatoria for tuberculosis; the fundamental problems of international hygiene; public food inspection, such as that conducted by the federal government for trichinosis in pork to be exported to foreign countries; and other problems calling for intelligent co-operation of the citizen in *national and international hygiene.*

Trained along these lines, the youths of America, whether or not afterward going to college or technical school, would enter upon their maturer life with some realizing sense of the general structure and operation of the body as a physical mechanism, and the necessity of obedience to physical laws. They would become familiar with the sources of diseases and with some of the more obvious ways of avoiding them. They would have some intimation of their duty, not only to themselves and to any families which they might afterward have, but also concerning wholesome houses, pure supplies, the safe disposal of wastes, and some of the problems of the municipality, and even of the nation, of which they are units.

We have, of course, to meet the important objection which will be urged against our point of view, that, desirable as all these things may be, the time available is too short for proper dealing with them. This, however, we deny. Time enough to do all these things, and do them well, either is now or lately has been found in the public schools in the various courses for instruction in physiology and hygiene. It will be necessary, it is true, to revise and bring up to date our subject-matter and our methods of instruction. We must teach less about bone and sinew, and more about muscle and nerve. We must teach less about anatomy and histology, and more about the germ theory of disease, about polluted water and polluted milk. We must simplify every statement and eliminate the unimportant. We must not seek to make of physiology a training in the precision

of measurements, or in scientific method, or in anatomy, or in physiological chemistry. Some experiments must be made by the students, and demonstrations by the teacher must abound; but we must keep steadily in view the practical object for which chiefly school time is, and long has been, dedicated to physiology and hygiene, namely, the rational conduct of physical life.

Above all, we must insist upon relief from the incubus of that "scientific temperance" instruction, so called, which has too long rested upon the teaching of physiology and hygiene, winding its tentacles about, octopus-like, sapping its strength and crushing out its usefulness. On this subject let us have no misunderstanding. The evil effects of the use of alcoholic drinks must be fully and clearly inculcated. The youth of America must be thoroughly informed of the insidious dangers which lurk about strong drink. But on the other hand, we must never forget that the public schools are no place for any propaganda, and that the freedom of teaching must not be surrendered even to reformers.

Whether we are pleased with the fact or not, modern life has become more strenuous. In order to achieve success, the individual must do more in a given time; hence the urgent importance of a personal hygiene which shall really guide him in the proper care of the body. Meantime the care of the public health has become one of the most important functions of government, and it will be increasingly important in the future. Its success in America must largely depend upon an enlightened citizenship to which it can look for support. We now teach history and economics and civics with some reference to the future life of the public-school pupil as a citizen. Our teaching of hygiene should keep in view the same great end; and if this paper draws attention to the lamentable inadequacy of our present instruction in that subject to this purpose, our object will have been accomplished.

But yet more is needed. We need a clear conception of the true place of physiology and hygiene, but we need also the proper teachers to realize that conception. If the subject is as important as we have represented, it should be taught by teachers

specially trained. In the higher grades of our schools we often have special teachers of languages, of history and civics, of mathematics, of the natural sciences; but it is rare indeed to find physiology and hygiene in the hands of teachers who have had special training in these subjects. Too frequently these are imposed upon the least experienced member of the staff, whose connection with the school is too recent or whose tenure is too precarious to allow refusal. All this must be changed. The exact method of securing the trained instructor may often be left to local conditions. At times, medical examiners, the demands of whose practice are not distracting, and who are at the same time good teachers, may fill the position; at other times, teachers of the biological sciences should be encouraged to prepare themselves for the work.

A method which especially commends itself to us is to combine this work with that in physical training. The teachers of physical training, of all the instructing staff of the school, stand in closest relation to the problem of preservation and promotion of sound health. At present their work is somewhat narrow and suffers from the lack of any sufficient explanation of the principles of physical training. It would broaden the work of these teachers and make their present efforts more effective, if physiology and hygiene, so obviously related to their other work, were placed in their hands. True, it would require a broader preparation and an extension of the work of our normal schools of physical training in both time and scope; but this is really an argument in its favor. Normal schools of physical training ought to extend and enrich their courses, especially in view of the fact that so many of their graduates must occupy positions in the higher grades.

There is a widespread feeling that the present training in physiology and hygiene in the public schools is a failure. But signs are not lacking of a strong feeling among prominent educators that these subjects can and should rank in dignity and usefulness with languages, mathematics, physics, chemistry, biology, history, and civics. Physiologists have long protested against the domination and excesses of "temperance physiology."

Educators have complained of the bad pedagogical requirements often placed by law upon the teaching of the subject. We appeal to the members of the American Social Science Association to aid us in bringing about a reform, not as parties to either side of a dispute on questions of scientific fact about alcohol, nor from the standpoint of pedagogic theory and practice, but because the subject is one which profoundly affects social conditions and is closely related to a more intelligent and a more successful conduct of individual and social American life.

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NATURE-STUDY TRUE TO LIFE.[1]

NATURE-STUDY true to life — there is no other! If there is anything abroad imposing itself upon childhood that is not true to life, it is not nature-study. It is its caricature; it is an impostor and a cheat.

Nature-study true to life has existed with children before they enter school since the creation of man. If we would hold it in the schools equally true to life, we must study the way nature teaches in this period and the way children learn. In their early years they learn because they love nature; if in after-years they fail to learn, it is because they hate science. They surrender themselves unconditionally to nature; but with science they barter and make terms. Nature itself fascinates and leads; science too often repels and drives.

A few years ago someone in Boston, I believe, sought by a questionnaire to find out whether children liked nature-study or spelling the more; and spelling won the votes. But the decision was not against nature, but against the teachers and the teaching. Were it a question as to which is the more delightful, the spelling book or a day in the woods, the groves would surely win. Children cannot repudiate nature for the same reason that water cannot run up hill — it would be unnatural, they would not be children.

Behold in this time the perfect scientific method of nature, the teacher and the ideal attitude of the child, the learner! Nature offers herself to the child as a coherent and rational whole. This whole appeals to the child through its function and purpose, which to him is primarily its beauty and then its use. Nature as a teacher at no time insists, nor does she persecute with her attentions. Neither does she hurry or demand so much or a definite result in a given time; she exploits no philosophy; she has no theories to prove; she simply offers herself in a thousand ways,

[1] Discussion of the topic "Nature-Study True to Life," before the Department of Elementary Education, National Educational Association, July, 1903.

and patiently waits for any response made by the growing mind to her appeals.

The young learner meets these overtures of nature with an intellectual attitude that is ideally scientific. He is not blinded by prejudice; he has not been enslaved by creeds; nor has he been frightened or coerced by authority unquestioned. He has that for which the scientist ever prays and which he rarely finds — the open mind. The evident purpose of the child is the full enjoyment of the life of the moment. He is not worried with any necessity for faith, nor is his life's flow choked by the appearance of doubt. He is immersed in nature, and nature thrills in him. He is a part, and nature the whole, to which he feels he belongs. Nature-study here is true to life.

In the schools it becomes false for many reasons. One of the most obvious is that the school begins its work without properly estimating the value of what the pupil has already learned. Many of the lessons of nature have been wrong, but they have been well taught nevertheless, and they have been thoroughly learned. The impressions of these early years have been almost indelibly fixed by the slow processes of absorption and growth, and nothing but the most careful presentation of new facts by methods as natural as those employed by nature herself can correct the errors in knowledge. For example, the child for six years at least has been learning in a most effective manner that the earth is flat; that it stands still; that the sun is small and the earth is large; that the sun is near by — just above the clouds; that the sun moves; and many other things of a like kind that are diametrically wrong. We usually attempt to correct these errors by feeding the learner a soft diet of easy definition — a method that at once makes nature, as he knows it, false to the life of the child.

Again, the great picture of nature which the child has gradually built up is by the methods of the schools shattered to fragments. This is accomplished by picking out bits here and there for special study, to the exclusion of much that is necessary to a clear understanding of what is presented. Teachers usually overestimate tremendously the child's mental confusion regarding

the facts and phenomena of nature. If he has had reasonable opportunities for observing nature (and if he has not, they must be provided), his mind will be a storehouse of facts of apparently many unrelated kinds, but actually, as he knows them, there is little or no disorder. They are usually well classified according to an absolutely natural method. If he studies a rose, it naturally classifies all the rest of nature. It stands as the function of sunshine, of rain, of soil, and of air. It exactly classifies the insects that visit it, and he himself takes his place in nature with respect to the rose. All nature becomes to him the rose and himself: and such study is eminently true to life.

When this picture is carried into the school, complete in its wholeness, and beautiful in the delicate balance and proportion of its parts, it is disregarded and shattered as a mirror struck by a stone. The school labors for long years to gather the fragments together again, but they are as a basket of rubbish — the charm of the original picture is forever gone. This is why all people love nature, but many hate science, or at least are indifferent to it. Science to them has been but the systematic means of destroying their nature pictures; and so far as this is true it has not been true to life.

The real function of the school is to preserve the original picture in all its completeness and further to develop it in breadth and in detail. The school's chief business now is to take the child from nature and cut him off from the original sources of material. Where once he had daily and untrammeled intercourse with things he loved, in the school program his contact is limited to the occasional excursion, when he is hampered with the feeling that he must see or learn some particular thing. Again, the nature-study of the schools becomes a discordant note in his life.

One of the most useful things that the schools can do for children is to make them skilful in the various forms of expression. Both in school and out of it children are being stifled in their growth through a lack of adequate means whereby they may express themselves. In terms of psychology, expression is the means by which we study and define our images. It is the one

way we have of finding out the status of our mental life, the value of the intellectual products, or whether there is any product at all.

Left to himself, the child exhausts every resource in his attempt to do this. He continually extemporizes ways and means of expressing himself, and while they may be crude and inefficient, they are of untold educative value, because they represent an intense effort to adapt a means directly to a definite end. Nothing creates so great a demand for expression both in variety and amount as the study of nature. We live in the domain of light and color. First and last our world is a world of color. By this sign more than any other the children, and grown folks too, know nature. As the sun pursues his noiseless course, he paints the panorama of the seasons with the many hues of the landscape. Morning, noon, and night, in light and in shade, the invisible artist is at work giving us new creations in color with every hour. When the earth wakes in spring and summer, color is the symbol and guarantee of life, and it is the most striking witness to its great abundance. In the winter the metallic and earthy shades of the lifeless world are not less beautiful and attractive. The coming and going of color mark the ebb and flow of health in the human being, in the tree, and in the grass; in short, it is one of the most reliable means we have for a scientific interpretation of nature. Yet in most of the schools the subject of color as a means of expression is treated as if the children were born blind and were ever to remain so. Where color work is introduced it is almost always simply a daub here and a daub there, which in no way tells the coherent and beautiful story of nature. When the pupil looks at nature and then turns to his paintings, he finds his picture in fragments like shivered glass in a basket; and once more he finds the methods of nature-study untrue to life.

In his contact with nature the pupil becomes aware of her forces through the work they do. The silent sunshine lifts millions of tons of water from the seas, and with it bedews the earth. Like a miracle unthinkable quantities of vegetation are called from the soil and air, and given an existence when appar-

ently nothing existed before. The prodigious operations of nature on every hand are challenged for him to measure himself against them, and to turn them to serve his purpose. It should be the work of the schools to give him the training and the tools by means of which he can command these natural forces. The "how much" and the "how strong" are questions which goad him from every side. But the one subject that would do this — mathematics — is so hideously taught that he goes through his whole school course without once ever suspecting what its real purpose is. At the end of eight years of so-called training in mathematics he leaves the public schools with his conceptions of quantitative relations in nature as poorly defined as they were when he entered.

The same may be said of his knowledge of form and proportion. Manual training is affording some assistance in this direction, but there is not half enough of it in the public schools. It is still confined to things that have no important function. In its relation to nature study it should give the pupil ways and means for testing nature's forces, and of utilizing them in the world's work. To this end there should be an enlarged opportunity to work in both wood and iron, and the shops should be open to the children every day the world around. The artistic side of the child's life is not stimulated, because he has little or no training in expression through the use of plastic materials. Nature's forms everywhere interest him, but his study of them is limited; it never reaches the stage of artistic development, because he has no appropriate means of expression which will enable him to examine, correct, and develop his images of forms. Clay, wax, sand, and plaster offer these means, but their use is an innovation, whereas they should be as common in the schoolroom as a sheet of paper or a bottle of ink. For lack of adequate opportunity to express himself in these various ways, a large part of the energies that are started and dimly outlined by his contact with nature are never developed at all. They shrivel up and pass out of consciousness never more to return, because our methods of study and teaching are not true to life.

Thus far I have dealt with the intellectual sides of nature-

study, and have tried to point out some of the falseness practiced by the schools. There is another aspect even more important than these, but teachers have not yet advanced sufficiently in their appreciation of it to even rouse a discussion. Yet until this question is properly settled nature-study will never be more than an expedient, a time-killer, a kind of convenient busy-work in the schools. It will be in great danger of displacement by the next fad until this highest of all educational problems is thoroughly studied and a clear and definite decision is reached. I refer to the relations of the subject to the moral life of the pupil. No study can possibly be true to life and retain a permanent hold in the curriculum that does not drive straight for the great center of all interests in this world — human conduct. The faith that the continued and accurate reporting of their observations in nature will, in time, train them to be honest represents the highest view of the average teacher who even considers the subject at all. But in this respect nature-study has nothing to distinguish it from any other study. When the pupil is called upon to recount an incident in history, he is under as strong obligations to tell the truth as he is when he weighs a substance in the laboratory or reports any other observation. If this were the only claim that nature-study had for training in character, it could be supplanted by any other study in a course, and, so far as the moral result is concerned, it would never be missed. It is precisely for the reason that teachers uniformly believe that the training in nature has nothing of higher worth than this incidental value that its place in schools is rendered at once indefinite and uncertain.

When we look for the last effect of the highest studies upon the human being, we seek for it in this character; but when we inquire for the ultimate effect of nature-study, we usually are satisfied to go no farther than the clothes he wears, the food he eats, or the house that shelters him or the money it puts into his pocket. The infinite beneficence of nature-study in improving these creature comforts cannot be overestimated, but they are not the end; they never can be more than secondary. What the creature *is* who is clothed, fed, and sheltered must always be the

paramount and primary question. The final query can never be, Is man *comfortable?* but, Is he good; is he trustworthy; is he reliable; is he honest; is he kind and unselfish? These questions call for the qualities that education must develop by *positive, not by incidental, means.*

There is but one question today worthy the attention of those interested in nature-study, and that is: Can this subject put these moral qualities directly into human character as effectively as the lessons of history do, not excluding Christ's Sermon on the Mount? There is not a community in this country today so stupid that it would permit a teacher to present the lessons of history to their children and leave out the story of Washington and Lincoln. The lives of these and other great men will be rehearsed until the last moment of time, because, independent of country and age, they give a profound and permanent uplift to the character of those who learn the lessons they teach. But there are few communities today where a teacher would be denied a footing because he could not teach nature-study to the children. From this fact, while neither the time nor the place will admit of its elaborate defense, I submit the proposition that in this its most vital aspects the teaching of nature-study is utterly false to life. If the stories of Washington and Lincoln make for character, and the stories of the frogs and snakes do not, then out, I say, with the frogs and snakes; I for one will have nothing more to do with them. If the lilies of the field point not "the way, the truth, and the life" as clearly and as unerringly as Christ himself did, then let us waste no more time upon the lilies. The supreme test for the value of nature-study is now at hand. For fifteen years teachers all over this country have bravely struggled to get the children in touch with nature. Books have been written by the score suggesting endless ways by which this may be done, and detailing devices to make the study interesting and pleasant; and substantial ground has been gained. During this time many burdens have been lifted from the pupils, and the teacher's work has been greatly improved. But the period of diversion is approaching an end. Not that the study of nature is to be less pleasant and interesting, but its purpose is to be more serious, more definite, more manifest.

The task now set for the friends of nature-study is great. It is not without deepseated result that for centuries mankind has been taught that the world and the flesh have been the joint partners of the devil. That nature-study can be a positive stimulus to the moral nature of man is a proposition resisted by the prejudices deep-rooted in the ignorance and bigotry of two thousand years. From the standpoint of moral development, man at first feared nature as something that was bent upon his eternal ruin. Then he despised nature as a stifling incubus upon his spiritual life. Today he regards nature as neutral and her teachings as irrelevant. This entirely false view of nature has given rise to an equally false and utterly misleading classification of studies in our curriculum; namely, the humanistic and scientific. We may study man *and* the *tree;* but we *must* study man. This partial view must always give undue precedence to the so-called humanistic, to the corresponding detriment of the so-called scientific. Whereas in the not distant future we shall find through the study of nature a proper evaluation of the so-called humanistic studies, it will be in the delicately balanced scales of science, it will be according to new standards of morality set up by a study of nature, that the true worth of all studies will be determined. When this is done, then all studies will be humanistic. As long as the ancient, but now almost obsolete, dualistic conception of man's nature prevailed; as long as man the *spiritual* being was set over against man the *carnal* being, so long has the house been divided against itself. But through the study of a nature—of life and its conditions—from that tiny sentient speck that, somehow, came into being in some sequestered spot, in some mysterious way, countless ages ago, down to the magnificent functions of a great brain that in its sympathy embraces the world, we are slowly getting rid of our primitive conception of a divided man. When at last our study shall no longer be *man* AND *nature*, but *man* IN *nature*, then will it be for the first time possible to have nature-study absolutely true to life.

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A WORD OR TWO ON SELF-ACTIVITY IN THE SCHOOLROOM.

It is perhaps a commonplace to say that one of the essential qualities of a man of power is ability to handle himself in strange situations in which he may be placed. Put two men down before the same problem in a field with which they ought to be equally familiar so far as their opportunities are concerned; let two statesmen attack the question of imperialism, for instance; or two physicians combat a new and desperate disease; or two teachers attempt to discipline a group of disorderly students; or two engineers endeavor to construct a bridge across a chasm. The man of power in any case will work his way through his problem; he will organize his experience with somewhat similar problems and use it to help himself in the present emergency; he will be dynamic, aggressive, original. But the weak man, not having dealt with exactly such situations before, is helpless now. He cannot draw upon his past for help in the present; he cannot mobilize his experiences, as it were. The complex problem before him, though it contains only factors with which he is, in their isolated form, familiar, yet it overwhelms him, and he withdraws from it, or stands before it sicklied o'er with lack of thought. The man of power always feels within him the ability to cope with new situations at all related to those with which he has dealt previously; but the weak man sees himself defeated before he begins the attack. His courage oozes out of him, and he grows flabby and inert.

The statesman of power believes that he can analyze out the various factors involved in the question of imperialism, and he can in the light of past conduct mark out a route for the present; so he girds up his loins and moves on the enemy. The physician of power can utilize his observations, gained in the treatment of all kinds of disease, to interpret the more or less strange case presented in the patient before him. The weak man, having never diagnosed just such a malady, does not now see and he

cannot determine what certain peculiar manifestations mean in reference to underlying principles. His experiences are fixed in certain forms or models or casts, and he cannot break them up to make a new model, choosing elements out of several of the old ones. His ideas adhere to one another as they were originally gained.

And then the weak man has never used his experience as a searchlight to explore dark regions; he has drawn back from unknown lands. He has either been afraid to be a pioneer or has not been willing to undergo the hardships of such an adventure. So he keeps to the beaten tracks. He does what he has previously done, and what he has been shown how to do. Therefore, when he finds himself face to face with an original problem, he is not equipped to attack it, because he has never undertaken such a task. He has none of the feelings or inclinations or confidence of the explorer; he has no sense of what it is to search out anything new, or how to go about it. So he accepts things as he has known them to be, and turns aside from everything unfamiliar, or treats it just as he does the things with which he is acquainted.

It will doubtless be granted by all that education should strive to develop in the young the aggressive attitude toward the world, for this is the essential requisite for individual and social prosperity. The individual or community that makes no improvements upon what has come down from ancestral times, in respect either of material or of social matters, must ultimately degenerate; for it seems to be a law of life that if there is not evolution there will be degeneration. In order even to preserve what is it seems necessary to be always striving to achieve something better. From those who have but who make no additions thereto even that which they have will be taken from them. Let a man of business cease striving to improve his methods, and he soon begins to lose even what he has achieved. Let the teacher stop growing, and it is not long before retrogression will set in. Nature seems to have planned profoundly for the continual evolution of mankind, and she visits a severe penalty upon those who refuse to co-operate with her in her efforts. Happily, though, she

has endowed most individuals with the disposition to be continually improving their lot, to be achieving a more perfect mastery of the world in which they live, so that they may thus obtain a happier and more effective life.

And what education must seek to do is to perfect this instinct and so make it effective in all the complex situations in which people are likely to be placed. Unfortunately it appears not to be so deep-rooted but that educational methods may stupefy it. We have all seen persons, and many of them, who have lost the power to deal with new situations, if they ever possessed it. They sweep and bake and knit and whip their children as their mothers and grandmothers before them did. So there are farmers who sacrifice a good deal in order that they may kill their hogs when the moon is waxing; they sow and reap according to the phases of the moon, because they learned the lesson from their fathers, and they have no disposition to question the wisdom of the past.

Now, it must be apparent that the way in which a child attacks and masters the situations presented in his spelling and reading and arithmetic and geometry and history and science will tend to establish in him a habit or method of attack which he will in later life employ in business situations, and in engineering, legal, teaching, social, and other situations. Observe a pupil in the very beginning when he is learning to read. Every day he must learn new words. When he encounters a word he has never seen before, the teacher may tell him what it is, and she may have him say it over until he fixes it so that when he sees it again he will be able to pronounce it. Whenever he encounters anything new in his reading the teacher tells him outright, and then he repeats what she tells him until he makes it his own. He never takes the initiative in dealing with new words. He does not use what he knows to help him in a new situation that is somewhat strange. When he runs against the new thing, though in its several elements it may be known to him if he would only try to use what he has already mastered in analyzing it, yet he is helpless, and he trots off to the teacher, who does not help him to use his experience, but makes it unnecessary for him to do so. Why should he be original, aggressive, when he can solve his problems more easily, as he thinks?

So he works along year after year, learning what the teacher or book tells him; these agencies relieve him from the necessity of finding his own way through new regions. Suppose this goes on, as it does in the majority of schools perhaps, during the whole period of the child's school training; how much power in reading has he acquired by the time he leaves school? He has mastered a few things, and these he can use well enough in exactly the way he has learned them, but he cannot employ them to assist himself in new situations. When he separates himself from some telling instrument — the text-book or the teacher — his growth ceases, because he has gained no sense of originality or independence in reacting upon this phase of his environment. He has no interest in pushing into new fields of literature where he will encounter new terms, because he cannot use what he knows to interpret them.

There is a quite different method which some teachers employ, but which leaves the pupil about as feeble and dependent as the first. They have heard it said that the child must be made self-active, that he must never receive any help, that he must dig out everything for himself. And so when he comes to a strange word he is refused aid, whether or not he has a sufficient body of experiences by means of which he should be able to handle the new thing. The teacher urges that, even if the child fails in his efforts, the struggle will be good for him. One sees this theory put into effect every day in the school. Children are trying and failing, and their guardians hope that in some mysterious manner strength will be developed out of weakness. So the child works on, struggling with new situations, and being conquered by them because he does not receive at the critical moment just the aid which will help him to master them. Such a teacher is a prodder; she is not a true assistant or guide. She does not know how to make a pupil self-helpful; when he fails she scolds him and tells him, and he learns by rote. He has not felt the power and gained the skill which come from mastering a new situation largely by his own effort. And after one has had a few years of experience with trying to make out new words in his reading, and much of his effort has proved of no avail,

and he gets scolded as the reward for his efforts, there is not likely to be developed in him a disposition to move vigorously on to new situations. Nature has not constructed the human mind so that it will keep straining itself to accomplish something when after repeated trials no valuable ends are achieved. She is not so wasteful of energy as this.

But there is a third way in which one may deal with a child when he is learning to read, regarded as a typical sort of school activity. When he is confronted by a new situation, the wise teacher knows whether he has already mastered anything which will help him in the present emergency. If he has, she throws him upon his own resources, reassuring him that by diligent application he can achieve success. But she follows him closely in his efforts, and does not let him struggle too long without success. Before discouragement overtakes him she gives him just the suggestion which calls into the foreground of his consciousness precisely the experiences which are related to the situations he is trying to master, and then he can see his course with reference to it. The new situation may contain no elements with which the child is not familiar, but when they are placed together he is confused by their association. His attention is distracted from a consideration of the several elements, and is dissipated in the attempt to comprehend the whole thing at once; and, the thing as a unit being unfamiliar, there does not arise to hand what he has already mastered. What the wise teacher does then is simply to direct the attention of the learner upon the familiar elements in a new word or a new problem or a new sentence, or any new thing. As she works day after day according to this method she develops in the pupil a tendency to analyze things for himself. He comes gradually to take the initiative in withdrawing his attention from the new whole which confuses him, and in noting the various factors thereof; and he acquires the power also of synthesis, or organizing parts into new wholes. And this develops efficiency, for it gives the ability to deal with new situations without being dependent upon someone else.

We have here glanced at one of the simplest situations in teaching; but if we look at more complex things we shall find

that the same principle holds there too, and in a more important measure. Take the teaching of geometry, for instance. In some of our schools one can hear pupils reciting off demonstrations as they would pieces from the rostrum. The proofs of propositions have been given in detail in their text-books, and they have learned them by heart. Anyone who chooses may hear pupils in our high schools who set out to show that a given theorem must be true, and before they reach the conclusion they get mired. Then they go back and start again in the hope that the vocal series which they tried to make automatic in the learning of the demonstration may become re-established by another effort; possibly they can catch up the dropped link by starting at the beginning of the chain. Such pupils never look at their constructions in the attempt to see for themselves what the relationships must be in the light of what they have already proved to be true in the past. But, to be more precise, they really have not proved anything in the past; they have memorized proofs that someone else has made.

And even if there is occasionally a student who memorizes a demonstration and then traces it out in the concrete problem before him, still he is not developing habits which will give him much power in the real situations of life. His mode of attack is always in seeking aid from sources outside himself. He has to be told how to proceed; he is not required to make out his own course in the light of what he already knows. When he lays aside his geometry, he has not gained the power which that study ought to confer upon him, either in dealing with geometrical problems or with the more intricate affairs of daily life. Suppose that, instead of having him learn the statement that the sum of the interior angles of a triangle is equal to two right angles, for example, and then learn the argument all made out for him, we ask him to find the sum of the interior angles of a triangle, and tell him nothing. He knows enough to solve the problem if he *will only use it*. If his mind does not work aggressively on this problem, we may set it going by asking him a question which will bring into the focus of consciousness what he has discovered regarding the properties of angles: "Do the angles at

A and *B* suggest anything you have proven heretofore?" "What have you shown heretofore to be true about the sum of angles?" "In the problem before you how can you make situations like others you have already had?" A few questions like this will make experiences in even the dullest mind dynamic to some degree, and the disposition to be self-helpful will be fostered.

When we consider such studies as science and history that ought to deal with complex relations which must be met by everyone, no matter what may be his particular vocation, we can see how vital it is that a method of study should be adopted which will develop habits of independence and originality in respect of the matters of which these subjects treat. The learning of dates and names from a text-book in history and the memorizing of statements about men and events do not equip the pupil to deal in any effective way with the social problems which history ought to help him to solve. It does not make him in a true sense social-minded, which the Committee of Seven says is the supreme object in the study of history. He has not reconstructed in his own thought and feeling the social situations which ought to be described in historical study. His mind is not filled with types of social action; verbal symbols have taken the place of images and feelings. And the schools are every day turning out into the community boys and girls who are quite unready to adjust themselves to the social, and more especially political, environments in which they are placed, because they have not been got into the habit of ferreting out principles of human nature in the concrete social life about them.

The same thing is true in principle of the study of nature, when the learning of things by rote is the method employed; when one spends his time memorizing what someone else has said about the phenomena of nature, he cannot be gaining that power which will enable him to search out the causes of happenings in the world, and give him stability and sanity in this bewildering complex universe. The memorizing attitude does not give much efficiency when one is face to face with nature transforming herself every moment into something new. There does not live in his brain real situations in nature that spring forth to

welcome any new event, so that the mind feels at home with it immediately. To the book-taught individual much of that with which he comes in contact in the real world is more or less strange and always remains so. And what is more serious, such a one does not possess the power of detecting the respects in which things differ from each other, or themselves change from day to day. As I said above, the book-taught mother cares for her children just as she remembers her mother did with her, or as she sees her neighbors treat their young ones. She makes no allowance for individual peculiarities, or for the incessant fluctuations in mind and body of any one individual. When she thinks of her children she is conscious of what she has heard or has been taught regarding them, and not of the individuals before her; she thinks of her rule and not of the children. And the principle is universal.

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THE EDUCATIONAL VALUE OF FAIRY-STORIES AND MYTHS.

STORY-TELLING is an art almost forgotten at the present day, and the story-teller is becoming more and more a figure of the past. What has become of the chimney corner with the cheery fire, the eager, happy children, and the good old granny who knew stories without end? The story hour, the children's hour, seems to have disappeared with the spinning-wheel, the hand-loom, and the fireplace. But the longing eyes, the open ears, mouths, and hearts are with us still and demand "the story." The nature of the child does not seem to have changed, and we are forced to ask ourselves, first, What is the cause of the demand? and, secondly, How may it be satisfied?

In this wonderful world nothing is too wonderful to the child. He knows his own power to do; so to his mind all things that do will to do also; the wind, the trees, the sun, even sticks and stones, seem like himself powers that exert their will. He knows but little of the laws of nature without, and of nature within self; but in his soul there is an instinct of wanting to know; there are longings, hopes, a groping for the truth. The demand for stories is an expression of the child's desire to learn more of the wonders of the world around, to get at the heart of things, to come into personal, intimate contact with the universe.

The fairy-story expresses the unconscious longings, hopes, and struggles of the child. It speaks to him in a language he understands; it gives expression to that which he feels but dimly and sees but darkly; through it he catches glimpses of laws governing human life; it interprets his own thoughts to himself; it gives him a perspective of this world and unconsciously influences his actions. But if this is the educational value of the fairy-story, the question naturally arises: Where are the stories to be found which may be such forces in the education of our children? Is there a test that will show the genuine value of the story to the child?

The story must bring joy — and this is, if we understand rightly what joy means, a good test for a story. A mentally healthy child will never come to love literature which is merely entertaining, merely instructive, or merely moralizing. His desire is for more than this. The child wishes to know, to think, to feel, to grow, and develop in all directions — this is a fundamental law of his nature.

We are often in danger of being so æsthetically aristocratic that we throw away something which is dear to child-nature, because we do not think it has great enough literary value. A great deal has been said and written about the myth and the fairy-story: that they give to the child wrong conceptions of human life and of nature, and that they in their fanciful dress have no place in the education of our children. But if we suppress the myth and the fairy-story, what are we to put in their place? Surely not our modern made-up fairy-story with a moral or scientific truth tacked on to it.

Once, in the childhood of the race, man was in many respects like this restless, hungering, groping child of ours. His environment asked him How? Why? and demanded a reply. The reply is the literature of that day — myth and folklore. The experience and wisdom accumulated by the race in the past found a lasting expression in the myth and fairy-story. Here man's innermost thoughts and feelings are revealed. The religion and art of the time, all that primitive man felt deepest, loved or hated most, is expressed in song or story, or was carved with loving hand upon his crude utensils.

When man was young on earth he had the happy characteristics of childhood: spontaneity, joy, light-heartedness, and a superabundance of energy. All these characteristics we find in the stories he told, and that is why folklore, the primitive myth and fairy-story, are an unfailing source of enjoyment and inspiration to the children of today.

It is not easy for us to become like a child again. Our modern made-up fairy-tales have many weaknesses. There is the tendency to preach, the overaccentuated moral teaching, the conscious analysis and philosophy of the adult, merely disguised as a fairy-story.

It is worth our while to look at the characteristics of the genuine fairy-tale. It is most natural that man first fixed his mind on the external phenomena which had so much to do with his well-being — the sun, the rain, the storm, mountains, and seas; and that at first most myths and stories were explanations of these natural phenomena. The natural world around him was believed to be ruled by the same forces and motives as those which determined his own actions. In order, therefore, to understand the universe, he must understand human life, as the knowledge of one was the knowledge of the other. The more he understood human life, the better he understood nature around him, and *vice versa*. His explanation of nature, therefore, became a portrayal of human life; and it is as such, as the beginning of literature, that myths and folklore have an educational value.

With the enlightenment on scientific questions the nature-meaning of the myth was soon lost sight of, but the human element contained in it was indestructible, and has been the germ of great literary productions in all ages. Educationally speaking, therefore, the nature-meaning of myths and folklore is of absolutely no value. The form in which they are handed down to us dates from a time when man was conscious of no such meaning. The efforts that have been made to convey to the child scientific truths through the medium of ancient myths show very little understanding of the true value of myths.

We are often surprised at the keenness of early man in detecting the essentials in human character. How much it is like that of today! And as the story-teller of old in his fanciful way gives us pictures of human life, we recognize that truth applies to all ages; and so each age has interpreted the story according to the scope of its understanding. The story has been the novel and the drama of the past. Some are great classics, true mines of inspiration.

Here are some of the ideals which we constantly meet in the fairy-tales: First, there is the boy who goes out into the world to seek his luck. Vaguely he seems to feel that the world has something in store for him, if he seeks it. Going a step farther,

we meet the youth who is more conscious of his aspirations. He goes forth to meet serious obstacles, which he must overcome, if he is to win the princess and half the kingdom. At last comes the hero whose whole life is spent in overcoming trolls and giants, yes, who is ready to lay down his life to save his people. Man in the story-telling period seems to have come to some definite conclusions: that human nature is good and kindly; that *good* will in the end overcome *evil;* that strength and stature are not always wise; and that wit and wisdom never fail to carry the day against mere brute force.

We find different stories expressing different phases of life—the serious, the humorous, the sublime, the ridiculous; and that there are stories fitted to all steps of development and to all occasions. You may find this material in the literature of strange people in far-off lands and of far-off times, but their stories are not strange or foreign to our children. The universal child-thought is expressed in universal child-language. We have, therefore, a wide field to select from, if we only have the wisdom to choose.

It is a great fallacy to believe that the story may be applied like a plaster or medicine for moral weaknesses. Often mothers and teachers ask: "What stories shall I tell to my boy who is not always truthful, or who is selfish, etc.?" It is not for literature to assume the power to teach moral laws. It were useless work for it to hew at the ethical nature of the child with unceasing hammer strokes. Still this conception of the use of the story is most prevalent, if one is to judge from the books published and the stories which are told in kindergartens, in Sunday schools, at home, and in the regular school.

The story must find the quiet way that leads to the heart. It must make the child aglow with a warmth which unfolds the desire for the good and beautiful as inperceptibly as the buds are unfolded in the spring. It must come quietly, discreetly, so that something is set vibrating in the child's soul, which will lead to action. Literature may inspire and awaken noble impulses when it is artistically presented, but will become worse than useless unless the child finds all around him chances to act upon these

impulses. Nothing but work which calls for truthfulness, and conditions which give opportunities for unselfishness, can help a child lacking in moral quality.

There must be no gap between story-land and the actual world in which the child lives. When the emotions are aroused — such as courage, kindliness, pity, self-sacrifice — the child must find something to act upon, something to do that requires these qualities. Many well-meaning writers of modern fairy-tales seem to go about their task in some such manner: They look at the virtues which ought to be sought and the vices which must be shunned. One or more of these are selected for the theme of a tale, and it may be a cleverly written tale. But if you and everybody else who read it feel and know that this story was told in order to teach this or that moral, you may be sure that something is wrong. Great novels and dramas are not made that way; neither is the child-novel and the child-drama. Healthy, normal children will have none of it. The writer may even cleverly disguise his motive, but in spite of him it lurks in corners and springs out when he is not aware. This kind of a story is, unfortunately too common.

Perhaps you have noticed how the "moral" story acts upon a child. A little girl said one day, when the talk was of George Washington: "I don't think much of George Washington since I heard the story about the hatchet. He must have been a very untruthful child, since they made so much fuss about his not telling a lie." Another girl said, when I asked her if she liked to read stories: "Yes, very much, but I always skip long descriptions and the preaching."

Classic literature, whether for the adult or for little children, merely seeks to place life in its many aspects before you — for you to observe, for you to interpret, for you to take that which you need.

An apparent enmity exists between the study of science and story-telling. The child's relation to nature around him is an intmate personal one. Hills, forests, streams, flowers, are friends, who inspire him with love and confidence. As the child grows older and his scientific knowledge of the world increases, this

feeling of friendship toward nature becomes stronger, but of a somewhat different kind. From a perfectly subjective point of view the child by the help of science is able objectively to view nature without and nature within self. There is no break between the story stage and the science stage, only development of ideas; and the true story spirit toward nature is never lost, but runs into a wider channel, giving color and emotion to scientific realities.

It is to be hoped that side by side with science-teaching the myth will maintain its place, not as an antagonist, but by its spirit a faithful companion, supplementing and making the other more complete.

It is a fallacy to believe that science needs to borrow the fanciful dress of the myth; it can well stand alone and hold its own. This sugar-coating of scientific facts, so common in our day, shows our inability to understand child-nature. Three-fourths of the so-called science-reading for primary pupils consists of such material as the following:

> Some tired little raindrops lay in the grass. "Come with me and have a dance," said the bright, sweet sunbeam; "but you must put on your white dresses first." And she kissed each one on the cheek. Then suddenly they felt themselves so light and danced high up into the air. But what should happen? Mr. North Wind was out for a frolic too, and when he met the little vapors, which we now must call them, they grew so cold that they had to put on warm winter clothes.

Such reading matter — literature is not its name — the healthy child naturally resents, and, however well intended, it appears just as affected and artificial to him as it should to us.

The fairy-tale or myth may have its origin in some observations of nature, but note the difference. Primitive man gave expression to all he knew, to his interpretation of the facts about him, to his honest feelings which were aroused. This made-up science fairy-story is written by a man, I think, who possesses the modern scientific knowledge, and is in form only, not in spirit, a story-writer.

Of late efforts have been made to select appropriate myths to correlate with science. In this attempt the mother and teacher

have often yielded to the temptation of reading into the myth scientific truths that are hardly suggested by the original.

It must always be kept in mind that the myth is a very partial scientific truth, and can therefore not give expression to the modern knowledge of science.

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SOME CONDITIONS OF EXPRESSION IN THE SCHOOLROOM.

It is not many years ago since the very idea of expression in the schoolroom was practically new. The old-time view was logical and simple. What could the child express, what could he think? Had he not come to school to learn, and not to teach? His place was to receive, and the only object of having him say or do anything was to see whether he had received what the teacher intended he should. A step farther on teachers found out by experience that saying and doing things on the part of the pupils not only formed a test, but that it actually increased their receptive power. This insight became crystallized in the maxim: "Expression is impression." This, however, and the movement back of it, still take impression as the real aim, while expression is related to it as a means. Since this is so, we are forced to ask: In what sense does expression which is thus subordinated succeed in being expression at all?

Let us look at it first from the standpoint of adult life. Suppose a person speaking to you is doing so only in order to impress what he is saying on his own mind, would you feel that what he was saying was really an expression? If I, in writing this little article, only desired to impress the ideas on my own mind, where would there be any expression, except perhaps of an accidental nature? No, an expression to be an expression must be intended as such by the person who makes it. Let us look, then, at this intention and what makes it up. Any intention is, of course, essentially an attitude or act of will, but the particular one of expression always involves some other person or persons. In this little article I may have misinterpreted my audience, but I am certainly thinking of a definite kind of person. In any expression the person to whom it is directed is as important as the content of the expression; in other words, the idea of the person spoken to is a condition of and determines the expression itself, not only in its form, but also in its content.

Everything cannot be said to everybody. Cast no pearls before swine, not only because it is wasteful, but also because it is hard on the teeth. There may be nothing wrong with the swine.

To what extent does the idea of the person or persons spoken to further or retard expression as it is found in school? There are two typical situations in view of which this may be considered: (1) The pupil is addressing the teacher, and has him or her in mind while he frames his speech, drawing, written exercise, or other sign. During this he may realize that he is being overheard by the rest of the class, although frequently this enters into his mind so slightly as to be almost inefficient in action. (2) The idea of the class or certain members of the class may become important, and what he is saying is really addressed to them and measured by the effect it produces upon them, whether the teacher be formally addressed or the class addressed directly, sometimes as also including the teacher. These two types of reaction are capable of shading into one another, and in certain conditions one extreme as well as the other can be shown to be justified. As one observes most recitations, however, there seems to be a very marked proponderance in one direction. In one school, for example, which I observed for a week, I found 97 per cent. of all the questions asked propounded by the teacher, and the 3 per cent. asked by the pupils never leading to any further development. No one can fail to admit that a very large number of the recitations made are directed in intention to the teacher.

When recitations from lessons previously learned by the whole class are used, this is necessarily so. In such cases the aim of the pupil is to impress the teacher with the excellency of his reproduction. The idea in itself is indifferent to him. He does not feel that he is communicating anything, since the teacher is supposed to know beforehand everything he is saying. Although going through the motions of social participation, he is in reality a picture of isolation. To say to him, "Speak so that the class will hear," or "Turn to the class," is but to deepen the irony of the situation. The mechanical excellence of the reproduction is the only expressible reality left him.

There are, however, forms of recitation in which nothing has been previously given in order to be learned, where the same unworthy hollowness exists. This is particularly true of the "development method" used by many (perhaps only "so-called") Herbartians. To see the story of *Robinson Crusoe, e. g.*, "drawn from" pupils who have never previously heard it, would give one a weird feeling of the power of infant logic, if the illusion were not so plain. Given the conditions — lonely, desert island, favorable climate, etc., etc. — different imaginers can make very different stories, one just as logical as the other. In fact, the children do offer all kinds of propositions, some of them delightfully childish. There comes to mind the answer of a child who, being asked what material she would use for building, said she would need some nails. Where would she get them? "At the grocery store." "But there is no grocery store." "Oh, I would go on till I found one."

Not logical from a narrow adult standpoint, but very real and natural. Practical enough, too, if the possibility of error is recognized as human. More than that, it is really logical. Our modern writers on this subject, if they have done anything since the time of Mill, have at least convinced us of the importance and, from one standpoint, of the ultimacy of induction, which means essentially the testing of a mere "working hypothesis" by the facts of experience. To find by such experience that the hypothesis is wrong is just as educative and just as logical as to find that it is right. No, it is not by the children's own logic that *Robinson Crusoe* is "developed." It is by means of the Jove-like (and also Juno-like) teacher's nod. It is a simple device: the teacher accepts those answers that are "right."

What does this condition of affairs make of expression? Although the teacher may fondly suppose there is in this a discussion, it is not really so. The aim of the pupil is simply to find out what is in the teacher's mind, not to communicate or to develop what is in his own. He does not intend to address the class, but the teacher, and the only reason for hearing what anyone else may say is in order that he may not use over again the same particular notion. It may be asked, however, if this

is not really an exercise in induction? It certainly is, but it is the teacher and her hints and expressions that are studied, and not the subject. At this point thinkers who commit the same fallacy as Arnold Tompkins, *e. g.*, cut the Gordian knot. They say in effect: "But we realize that the subject of the lesson is always the subject as it exists in the mind of the teacher, whether he be represented personally or by a text-book. It is self-activity all the same, and the business of the pupil is to study this self-activity and make it his own, however it may be deposited.

This is only one side of the truth, but when the pupil honestly thinks it the most worthy thing for him to do so to study the teacher or the text-book it is then also the whole of the truth for that particular situation; but what goes to make it thus is the fact that the pupil freely, or with a consciousness of freedom, planned it so himself. If the teacher has the skill to make what is in his mind so necessary and interesting that the pupils feel they need to get it, this is a perfectly legitimate and honest relationship. It is one, however, in which the teacher expresses himself, and not one in which the pupil expresses himself. But even from this standpoint, whatever is true of the higher schools, no one can doubt that for a large part of the time there is no such feeling on the part of pupils in the elementary and grammar schools. It is because of this that tricks or "devices" are used to make an apparent or temporary necessity and an apparent interest sufficient to hold the pupils in the presence of the teacher. If pedagogy consists in the detailing and the classifying of such methods, it is certainly the footpad of the moral sciences, and teaching becomes the polite art (with a good deal of coercive force back of it) of holding up the children.

No, as everyone sees, there must be real, not simulated, willingness. But can anyone suppose that a willingness simply to find out what is in the text-book or the teacher's mind can persist for five hours, and including home work for ten hours a day? Shall we then cut the hours shorter? That does not follow. On the contrary, why not give a real chance to the

other side, the individual-pupil side of life? A child wants sometimes to give as well as to get, to do someone else some good, or even some harm or annoyance if nothing better. It is tiresome to go through the mere motions of expression, and to fail so often of the reality. At last one gets a little paralyzed and does not care; sometimes adopts the school attitude, when on no account one reads out of school anything even remotely like what he reads in school, or in the effort to understand the process as a whole turns it into a drama with one's little friends, usually a comedy in spite of the elements of tragedy contained. To those of us who feel with children it does not seem as if this is all that childhood has a right to have.

On the contrary, there must be expression in the school, and it must be real. Such expression must be meant to be a communication, and therefore framed with the view of some other persons in mind. These conditions seem impossible with both the so-called development method, as usually applied, and with the old-fashioned text-book and lecture method. Of the two the text-book or the lecture is at least more economical and direct.

Now, so long as we regard the subjects of study on the school program as already completed, and therefore, to be learned, the pupil must submit himself to the text-book or the teacher. Any real expression on his part is not only secondary, but idle. Such work should be wholly planned out, administered, and executed by wiser heads. To leave mere details of plan to the pupils, as to the private in the ranks, does not change the plan. The details are supposed to be foreseen by the wiser heads. If we are logical, we may even see that with such an ideal, the fewer the pupils the better; or, in other words, the finer the grading the better. One pupil in a grade would be the best, but since this is practically difficult on account of the expense, approximate it as much as possible, as does, for example, Superintendent Search. Such a course, too, would be much more perfectly adapted, if we only knew the exact mental and physical condition of every pupil beforehand; or, lacking this, at least such a previous knowledge of the average pupil of various ages, or a refined knowledge of the stages of growth. In a word, as educators we

would attempt to predict everything beforehand, scientifically and accurately. Now, given that we have a pupil who merely wants to learn what is in the teacher's mind or in the text-books, it would seem as if the rest of it might be previously planned; but this is only on the assumption that we already know the pupil's plan. If it is a very simple one, namely the getting of whatever ideas are presented to him, and the reproduction of these, I suppose we can run a certain kind of school on these lines. Poverty-stricken as this idea of the pupil is, it is very largely the idea that governs the conduct of the present American school, although we are by no means responsible for its inception, but have inherited it weakly from the past, long after the rights and needs of the individual have been appreciably vindicated in other spheres. Even in such a helpful book as Professor DeGarmo's *Interest,* we are not advanced beyond the thought that the school life should essentially consist for the pupil of "self-welcomed problems," leaving it entirely to the teacher to propose these problems, and presumably to know the answer beforehand. Most of our books on pedagogy contain the presupposition of self-activity. The way this is taken, however, is much as indicated above, viz., the assumption that we are dealing with a pupil who desires in a general way to learn, or who keeps to the simple plan of getting ideas that are presented to him, and possibly reproducing them with accuracy. Should the pupil want to do something else, this kind of self-activity is ruled out of pedagogy. As a result, we find the books on teaching really dealing with what the teacher should do at best, on the supposition of the above simple plan of the pupil, at worst as to how he may be persuaded or compelled to confine himself to such a plan in action at least. The contrast between such treatment of self-activity and that of certain modern writers on this state is truly remarkable. Of this Bosanquet might be taken as an example, when he shows that the essential duty of the representatives of the state is summed up in the maxim, "Prevent hindrances," thus assuming that things are going on even without these representatives, and that the self-activity of the citizen is real and evolutionary.

Now, it will be said that this is just the point, viz., that there

is an essential difference between citizens and children who are not citizens. This may be so for the state. But what is the school? Is it not simply an institution for the training of citizens? This has now become such a commonplace that we fail to interpret it in the light of our present ideas of citizenship. Here let me emphasize one point only, which is already that of President Eliot. Why train a child to habits which he is not intended to use when he grows up? And why omit the training of habits which he is expected to use? No training in mere obedience and in mere receptivity will ever give a pupil the virtues of real self-reliance, resourcefulness, expressiveness, and self-government.

Here we may remark that the self-government referred to must be concerned with the real work of the school or of those in the school. We do not recognize this to be in all cases the situation when pupils are called in to "govern themselves," for the sake of issues which are planned by the teacher. Here the self-government has nothing to do with what is taught and only amounts to policing. It is only when work is actually willed and planned by the pupils, or in as far as it is planned by them, that any real self-government can arise, and, as we have seen, this is also a condition for any real expression. We must either deny self-government and expression in the school or be prepared to admit that pupils in their own personalities, full of real desires, whether these give rise to whims or wise plans, must be permitted, encouraged, and aided in bringing these out, and in realizing them to the fullest possible extent.

There is no doubt that a considerable body of teachers are already working successfully in this direction. The changes that have come over our school program are very largely a manifestation of such a conception. Domestic science, manual training, industrial arts, nature-study, etc., although sometimes in a state of complete relapse to the mere dictation side of education, are for the most part full of the idea that the child must really feel himself a cause, or a source of plans and projects. Not only here, but in many classes in literature, geography, history, etc., the same idea obtains. The teacher in these cases does get down

to the consideration of some of the real plans and even the whims of the child. She does, in many cases, find the child where he actually is, and, instead of outlining an external logical ideal, helps him to organize his own experience, nearer to his heart's desire. It is only in the light of these facts that I venture to suggest, without much reference to detail, the direction, although not the finished result, to which such experiences seem to point.

To some extent at least the school must be made a clearing-house for real life. The term "course of study" is very variously interpreted. Most clever teachers can drive a coach and four through a pretty rigid course of study, if they think it necessary to do so, although the danger is more prevalent that teachers do not live up to the freedom already involved in the course of study. But if the course of study means what the pupils do in school, then expression and self-government must mean that the pupils make a part or contribute a factor to the course of study. If we regard the time-table as a necessary consequence of the course of study, this would mean the planning either of the whole or a part of the time-table. Now, in as far as the pupil desires and agrees in any given program, his plan is identical with the teacher's. But there would seem to be an opportunity here for some differentiation. A certain properly limited section of the time-table and of the program may be devoted to the freer and larger growth of pupils' plans. What this part of the course of study will be it is impossible to say beforehand. That it will not appear to start off in many cases with geography, history, reading, writing, spelling, etc., would seem tolerably likely, and this may be of itself sufficient to prevent such an opportunity being countenanced by most teachers. The pupil's part of the course is much more likely to start off at the very place he finds himself, and to reflect conditions strictly as they appear to him. His first and necessary step will be to say what he proposes to do. What time he needs, whom he needs to help him, what material he needs, if any, what place he intends to work, what difficulties stand in the way, etc. It may be that such proposals are made to others before they are made to the teacher, but ultimately they must be made to her, as it was from her invitation

as a school authority that the opportunity started, and she therefore must regard herself as a partner in every plan. This gives her naturally the chance to co-operate and even to suggest, so long as she feels sure the pupils are capable of rejecting or vetoing her suggestions. It also gives her the same right of vĕto, which, of course, must be exercised sparingly and with the best of judgment.

Now, although in the lower grades these pupils' plans do not usually begin under the name of the conventional school studies, experience for the last three or four years with work of this character shows that they involve these school studies and frequently actually advance them in the pupils' minds more rapidly than has been possible in the ordinary way. The pupil finds out that, to carry out many of the things he really wants to do and thinks worth while, he must use numbers, reading, and writing, drawing, etc., in order either to show what he has done (which is generally part of his plan) or to obtain information to carry out his ideas. As for higher grades, I may say that when pupils' planning has been applied in my own classes in psychology or pedagogy, there is no doubt not only as to the reality of the expression, but as to the actually increased rate of scholarship on the part of the pupils.

Space forbids me to enter as I should like into more concrete details. I will finish with one matter of striking importance. Starting with the individual we have found in most cases that he was already in co-operation with others; that is, apart from the presupposed relationship to the whole class and the teacher. A little group is formed, which is sometimes weeded out and sometimes increased. This little group is the organ of the idea; but, on the other hand, the group modifies the idea. Sometimes in such association there is little left of the original idea but the enthusiasm or personal attraction which helped to pull the group together. These groups have all the problems of real self-government, at the risk of going to pieces if unsuccessful, as well as the opportunity of constant discussion and expression within themselves and at more stated periods with the rest of the class. In the higher classes (as in psychology), groups or com-

mittees are used, but are not seemingly so essential. The individual is both more self-sustained and more capable of coming into contact with the whole of the class. Even here, however, there are certain pupils never found at their best unless in the narrower circle of a smaller group.

Some such opportunity of real expression, however it may be expedient to limit it on the school program, is necessary for the best development of future American citizens. The particular form which experience shows already possible is not the only form, or probably the best. Not only must every school, but every class, and every succeeding class in the same grade, pursue somewhat different ideals, but they must also find themselves in different environments, and thus with different means for realizing themselves. In any case, however, and despite the poverty of circumstance, life that is not artificially trammeled is always rich enough to incarnate itself anew, continually manifesting itself in the most fascinating varieties of individual and social growth.

COLIN A. SCOTT.

BOSTON NORMAL SCHOOL,
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A FIFTH-GRADE SCHOOLROOM.

THE chief problem of education lies in the difficulty of establishing vital connections between the needs of the immature pupil, on the one hand, and the culture and material achievements of the race, on the other. This demands a selection and adaptation of this material to the needs and purposes of development, and in this way involves the element of idealized make-believe. School work never can consist to any considerable extent of the actual work of the world. The past must be presented as a drama, idealized in thought, pictured by the imagination, and acted out in the motor activity of school exercises.

Our aim is to convert the school exercises into organized play — as earnest as any work, as true as any story, and as educative as any experience. Instead of the factory system of forty or fifty little workers turning out their machine product under uniform specifications, sitting in straight rows at screwed-down desks, the pupils are now grouped about round tables and are led to be mutually helpful, as, indeed, the nature of play requires. The main activity in the schoolroom should be learning, not teaching. The teacher has no platform, nor table, nor chair; he never lectures, nor has he time to sit at a table. The opportunity for work is given, the motive for self-activity is roused, and in most cases there is no need then of compulsory tasks. But those that *will* not, when they *may, must.*

The literary society meets on Friday afternoons. The responsibility for the performances rests with the children themselves. The teacher is a friend to appeal to for help, but the majority rules and not the autocrat. Recitations, dialogues, readings, essays, riddles, jokes, magic, vocal and instrumental music, and a debate, with sometimes a periodical and roll-call with sentiments or quotations, make up the weekly program. Very usually there is parliamentary business of some kind. If a member fails to perform ,the president asks him to state his excuse. Usually a motion to excuse follows, which is then dis-

cussed. The chairman of the program committee is usually involved, as it is his duty to arrange the program two weeks in advance. When the discussion is ended, the motion is put to a vote. If the excuse is not accepted, the non-performing member must give a recitation before the school on the following Wednesday morning. The work done for the society is far superior in educative value to any lessons planned and assigned by a teacher for class exercises in English. One of its most important uses is its training of its members to govern themselves and to obey majority rule.

The Chautauqua Junior Naturalist Club meets once a week or oftener for discussions, reading of a paper, or the presentation of some scientific fact. The children subscribe for *Pets and Animals,* Springfield, O. Seven other papers are kept on file in the room: *Puck, The Youth's Companion, Boys and Girls* (The Stevens Publishing Co., Ithaca, N. Y.), *The Bubble* (published for boys by one Karl Keffer, Jr., Charleroi, Pa.), *Nature Study* (Manchester, N. H.), and *The Little Chronicle.*

We keep a daily weather record on the blank shown on the following page. The daily weather maps of the Weather Bureau come to us. The course of the "highs" and "lows" across the country is traced, and the climatic conditions of the entire United States are studied. The blank maps of the bureau are used for summaries and exercises. The weather work not only involves meteorology, but most helpfully drills the geography of the United States, teaches considerable astronomy, and organizes some of the arithmetic work.

For the geography we have a relief model of the northern hemisphere, fifty inches in diameter; chart maps (scale ten miles to an inch) of most of the states separately cut out on the boundary lines; four outline blackboard maps with physical features painted in oil; and several dissected maps of the United States. This material is all home-made, and is more useful and better adapted to our needs because it is so. We are finding great help at present from a miniature river[1] that is eroding its bed

[1] The idea of this working model with a flowing river is due to Professor H. J. Banker, of our biological department.

through six feet of rock, sand, clay, soil, and slate, from a lake where it rises in the mountains down over cascades and windings to the coastal plain and delta at the seashore.

The physical features of this "Land of Lilliput" are named,

Weather Record of _____

WEEK NUMBER.....	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Summary
DATE								
SUNRISE								
LENGTH OF FORENOON								
SUNSET								
LENGTH OF AFTERNOON								
DAY'S LENGTH								
MOON AND STARS								
PRECIPITATION	a.m. p.m.	a.m. p.m.	a.m. p.m.	a.m. p.m.	a.m. p.m.	a.m. p.m.	a.m. p.m.	
SKY								CLEAR TIMES
CLOUDS								CIRRUS CUMULUS STRATUS NONE
BAROMETER 29 in.								H ON L ON
WIND								PREVAILING WIND
THERMOMETER	90° 80° 70° 60° 50° 40° 30° 20° 10° 0°							90° HIGHEST 0° LOWEST RANGE
INDICATIONS								STORM CENTER PASSED US ON
WEATHER MAP HIGH LOW								
DIFFERENCE FROM NORMAL H L								

and maps showing the changes in flood and draught are drawn. The Shewassee River rises in Lake Nokomis, whose source is the Sand Spring in the side of Hiawatha Mountain. The chain of the Ring Mountains surrounds Lake Nokomis. A few decimeters from the lake the Shewassee plunges over Minnehaha Falls into

the pool below, and then begins its course of washing down its valley. At flood time the river fills its valley from hillside to hillside, but in the drier time, when Minnehaha Falls only sparkle their beaded streamlets, the Shewassee is a modest little stream cutting down its flood plain in a single narrow bed. Several islands have formed. The largest of these is Mackinac Island, due to the "Big Head," an enormous human head of stone (clay) that has collected enough gravel and bowlders beside it to divert the Yazoo branch that formerly flowed here all the year round. Now it overflows only at the spring freshets. Under the cliff lower down the Shewassee has washed out Fingal's Cave. The upper part of this formation is hard, with an understratum of soft, sandy earth which easily washes out, leaving caves for a while, until too much of the foundation is washed out, when the roof falls and the cave is no more. The delta formation shows all the characteristics of the Mississippi delta pushing out into the Gulf of Mexico. It has three main branches, in each of which the stream washes out its channel, except at high flood, when everything is covered with water at the delta and the soft alluvial deposit is rapidly carried away. There are several mud volcanoes over in the Bad Lands, northeast of the Shewassee, and from the top of Devil's Leap a perpendicular descent of two decimeters shows the flat wall of rock down which the Fiend jumped.

The soil and rock are prepared in strata and faults, outcrops and tiltings, so that the little Shewassee may find its life-history as similar as possible to that of its giant brothers of the earth. The great advantage over the sand model is that here the river makes its own bed, it is active and moving, changing and "going on forever." It has the fresh interest of a living animal. Its eddies are like thoughts that indicate a changing purpose; it seems pulsating with life, murmuring and babbling over its gravelly bed.

I have often thought I should like to see the ceiling of a schoolroom covered with a converse of a map centering about the home and giving distance and direction from the home town. There would be circles drawn at scale intervals to indicate dis-

tance to the eye, and the names of towns, lakes, mountains, etc., would be painted as on a map; but we should be looking at it from below, and thus should get its converse. It would be as if we were looking from the inside of a transparent globe at the surface features. It would help immensely in training the pupils to think of the real world under their feet, instead of referring every place to a map or model.

The architectural ornamentation of our houses is for the most part absolutely meaningless. Designs for wall paper or frescoes are fit only for geometric paranoiacs. Why not surround our children with symbolic meaning? Put mottoes and proverbs on the walls, with symbolic and typical scenes from the history of civilization. Below these should come a chronological chart of history by years, and with dramatic episodes and pregnant events pictured in striking yet simple form. Every pupil needs to carry such a mental chronology form in mind throughout life.

Would that a writer with the genius of Shakespeare would dramatize the episodes of American history! The children need to have the story acted out, but there must be a poet and artist to recast the story in dramatic form. It cannot be given in its bald actuality as in the text-book. What the play of *Julius Cæsar* is to the facts of Roman history in the first century B. C. is just what we need for the facts of our American history now. For the elementary school we need historical plays and dialogues and historical novels more than we do history text-books.

Of all the subjects in the curriculum arithmetic is the most poorly taught. There is scarcely a beginning yet made of anything like an organization of the number work to help build up actually definite images of the world. I doubt whether the reform can ever come without giving up the teaching of arithmetic as a subject for its own sake. In geography we need a great deal of number work, to build out the clear concepts of areas, relative size, population, etc. Everything contained in the Census Reports on manufactures, agriculture, commerce, vital statistics, and population is such needed material. Take the graphic presentation of census facts as given by the charts and maps prepared

under Henry Gannett's direction as a sample of what such arithmetic work would cover.[2] Scale drawing, measuring, and plotting are among the most natural and proper exercises for children in arithmetic. It is our commercial age that has forced the money problems into the arithmetic. Most of our pupils have no interest in nor relation to the use of money as described in the current arithmetics. Consequently they do not understand the problems nor apply them. The ten volumes of the Census Report for 1900 are the freshest, fullest, and most usable and suggestive material I know of in industrial and commercial geography and arithmetic. To master any of these facts one needs the help of arithmetical processes. It is this help quite as much as any teaching of arithmetic that makes the reform needed.

Our cloak-room we have long ago turned into a work-room, with carpenter's bench, tool chest, nails, screws, etc., for the making of apparatus, charts, models, and other things daily. Here are made models of Columbus's fleet, weaving looms, bird-houses, checkerboards, oil derricks, models of bridges, canal locks, sun-dials, etc.

The periodicity of interest that children show in their games is in striking contrast to our logically framed curriculum, where each subject marches evenly through the year, until dropped in vacation. Do any children play marbles, trundle hoops, or fly kites all the year around? Would not any subject be better taken care of by having it for a season and then turning to something else? If the children were free to choose, I believe they would so arrange it. Just before St. Valentine's Day we have the utmost interest in drawing and painting with plenty of motive. In the fall the children are swinging and turning somersaults on the horizontal bar that is fastened to the door-frame of the workroom. They never look at it in the spring. Hallowe'en is the time for masquerades. So should we have fractions, or Columbus, or Massachusetts, or drawing, or diagramming right on and on while the interest is intense, and then drop it for a time to take up some other branch.

[2] *Cf.* HENRY GANNETT, *The Building of a Nation*. New York: The Henry T. Thomas Co., 1895. Also the charts and maps in Census Reports.

The children that need only suggestion and opportunity in order to do their work make rapid progress, are excused from considerable mechanical drill, and thus gain time for much more valuable work that the dullard never can get. Some learn in a single lesson how to divide words into syllables, and need but little drill afterward. Others must be drilled for months on the simplest things. To use these methods of the feebleminded on ordinary children stunts their growth. Hence it is necessary in every subject to draw off those who need continued drill and work with this smaller number intensively while the bright ones are doing far better at some other, more exacting work. For example, the best ones are started at the use of the dictionary first, and can later assist the duller ones over their difficulties. The brightest pupils do not need to be shown how to find a word, its meaning, its etymology, or its pronunciation; they understand indexes, appendixes, footnotes, tables of contents, etc., intuitively and need only suggestion. "When I have presented one corner of a subject," said Confucius, "and the pupil cannot make out the other three, I do not repeat the lesson." Such pupils go into the drill class for the duller routine of methodized teaching.

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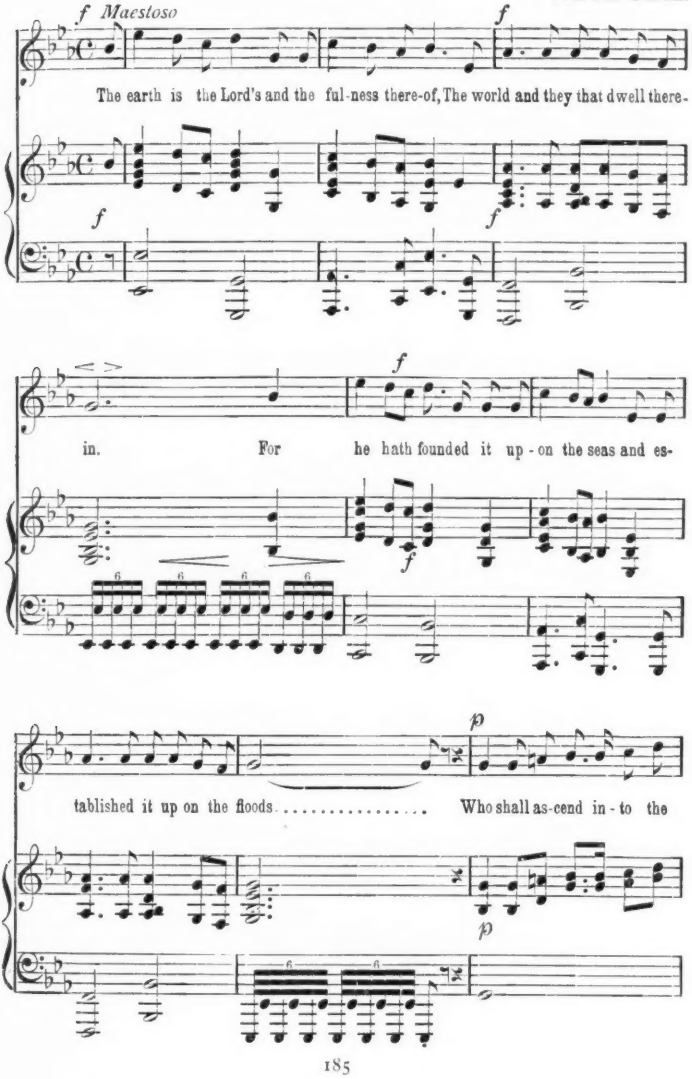
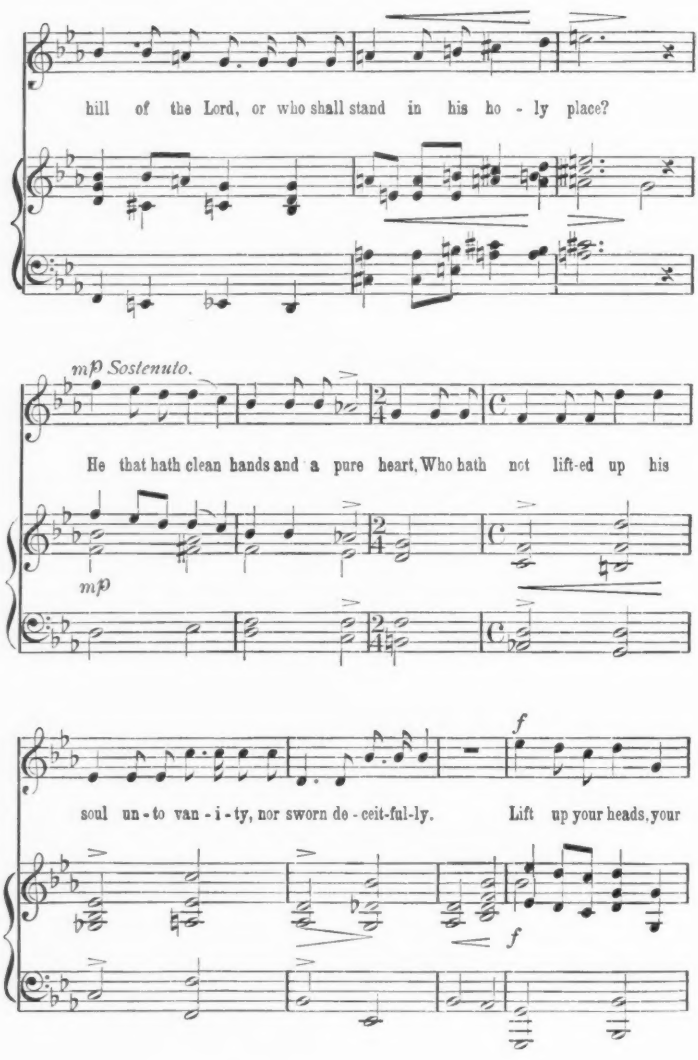
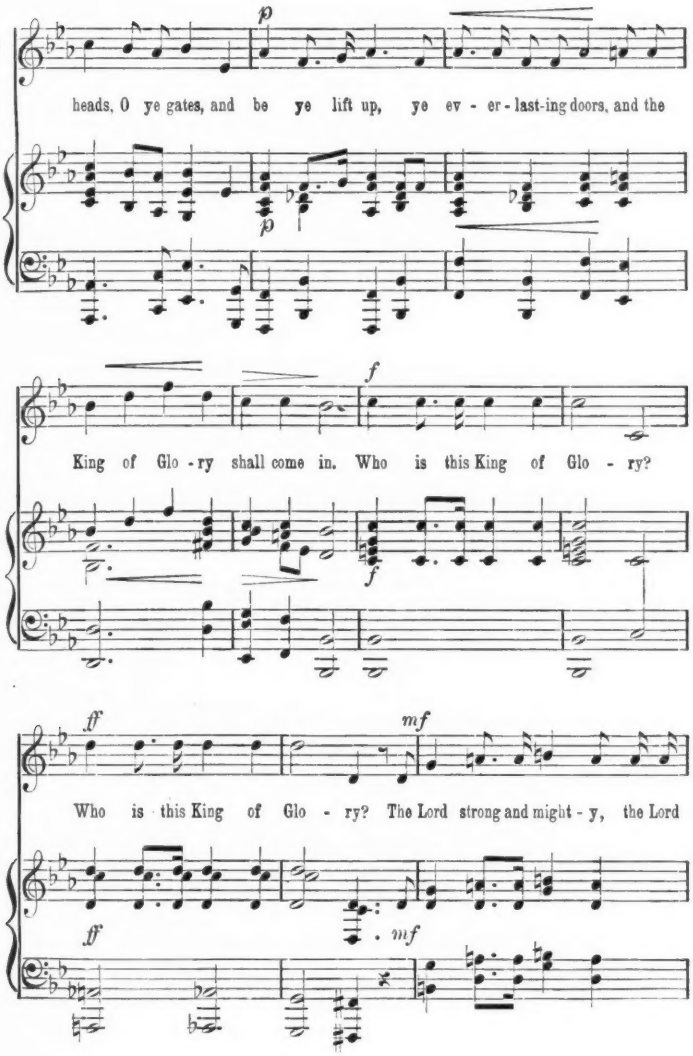
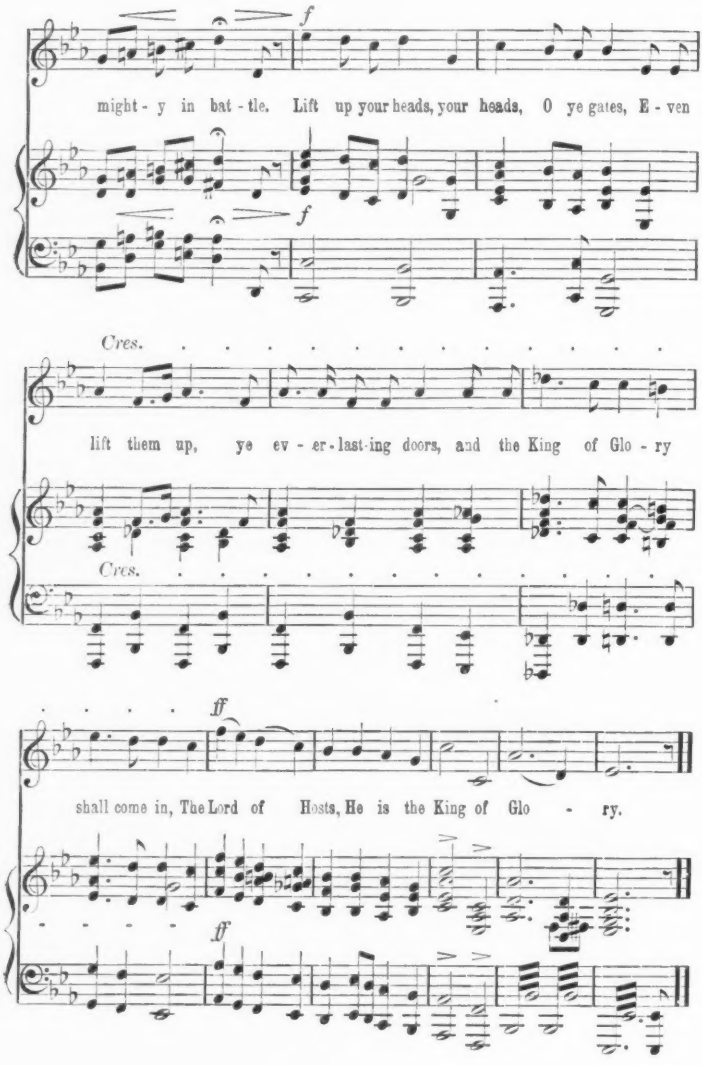
THE EARTH IS THE LORD'S.

ELEANOR SMITH.

f Maestoso
f
The earth is the Lord's and the ful-ness there-of, The world and they that dwell there-
f
f
in. For he hath founded it up-on the seas and es-
f
f
p
tablished it up on the floods..... Who shall as-cend in-to the
p

hill of the Lord, or who shall stand in his ho - ly place?
mp Sostenuto.
He that hath clean hands and a pure heart, Who hath not lift-ed up his
mp
soul un - to van - i - ty, nor sworn de - ceit-ful-ly.
f
Lift up your heads, your
f

p
heads, O ye gates, and be ye lift up, ye ev - er - last-ing doors, and the
p
f
King of Glo - ry shall come in. Who is this King of Glo - ry?
f
ff
mf
Who is this King of Glo - ry? The Lord strong and might - y, the Lord
ff
mf

f
might - y in bat - tle. Lift up your heads, your heads, O ye gates, E - ven
f
Cres.
lift them up, ye ev - er - last - ing doors, and the King of Glo - ry
Cres.
ff
shall come in, The Lord of Hosts, He is the King of Glo - ry.
ff

SHALL THE EXAMINING AND LICENSING OF TEACHERS SET A MODEL IN PEDAGOGY?

He is best equipped for life who has formed a habit of most efficiently organizing his resources (the known) in the solution of life's problems. Therefore the great aim of our school system should be the formation, in the pupil, of the habit of using the known effectively in the acquisition of the unknown. To accomplish this fundamental aim, teachers should be licensed and employed who possess, in a strong degree, this power to organize the subject-matter. But only such boards of instruction as possess this organizing power are capable of preparing the questions and examining the manuscripts which will test this power in the applicant for a certificate.

An examination of sample questions prepared by state, city, and county boards of examiners reveals the fact that a very small percentage of the questions test this organizing power; nor are a large percentage of the examining boards specially fitted to discover this power if displayed by a teacher in his manuscript. Even though the questions were pedagogically framed and the examiners of manuscripts thoroughly equipped, time is wanting in the ordinary examination sufficiently to test the power of a teacher to organize the subject-matter of instruction. Then, the things requisite to this reform are a board possessing the ability to prepare the questions and examine the manuscripts ,and more time both for the examination and the grading of the manuscripts. The requisite of sufficient time is met in the summer normal institute found in most of the states. While the boards of instructors in these summer normals are not all that could be desired, they are, as a rule, much stronger than the board for the examination and licensing of teachers.

The proposed reform would consist of the preparation of thoroughly pedagogical questions by a state board, the strengthening of the board of instructors in summer normals, and the

intrusting of the issuing of certificates in the common branches to these boards of instructors. The issuing of certificates in the higher branches should be intrusted to boards of instructors in a few district institutes located at educational centers throughout the state. These boards of instructors, both in the common and the higher branches, would have ample opportunity of supplementing their written examinations by occasional tests and oral recitations; also of estimating the personality of the applicant. In this way the teaching power of the applicant could be much more accurately measured than by the present written examination. One serious objection to the present method of licensing teachers is that it is difficult to convince the people that the inexperienced applicant in the possession of a certificate needs pedagogic training before entering the schoolroom as a regular teacher. This is not strange when the certificate certifies that the applicant is prepared to teach.

The following are examples of some questions that test the ability of the applicant to organize subject-matter for instruction: By a series of questions and answers, develop a beginning lesson on square measure, interest, stocks; on the reason for the location of the strategic points during the French and Indian wars; on the attempt to open up the Mississippi River during the Civil War; on the relation of the Omnibus Bill to the Missouri Compromise; on New Orleans as a cotton center; on the rainfall east of the Andes; on the commerce of the Great Lakes; on the industrial steps intervening between the raw cotton and the finished garment. Or again, the applicant may be required to outline a lesson, or make a written assignment of a lesson in such way as to stimulate the pupil to his best efforts; or to take any statement in geography, history, or other branch and show its concrete contents by tracing relations.

Shall we fully utilize the great schools of education?

I lay it down as fundamental that the great schools of education, such as the College of Education in connection with the Chicago University and Teachers College in connection with Columbia University should be fully utilized. To this end, it is necessary, not only that they be filled with students, but that

they be filled with students who can carry back to their constituency the educational reforms inculcated, and become leaders in their respective communities. My plan is for counties, state senatorial districts, or congressional districts, or county, district, or state associations, to send representatives to these great schools of education. Representatives might be sent by county normal institutes, by a city, or by men of wealth. These representatives might be sent on condition that they donate a certain amount of instruction in the normal institute on their return. Where a representative could not be sent for the entire course, or for a year, he might be sent for the summer. The schools of education would probably be willing to meet this movement by the granting of a limited number of free scholarships on properly guarded conditions. The above thoughts have been suggested to me from observing the miscellaneous attendance during the summer upon some of these schools of education.

L. E. WOLFE.

SAN ANTONIO, TEX.

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